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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/668,833	09/23/2003	Michael T. Rowan	68865.001002	4989
21967 7590 11/28/2007 HUNTON & WILLIAMS LLP INTELLECTUAL PROPERTY DEPARTMENT 1900 K STREET, N.W. SUITE 1200 WASHINGTON, DC 20006-1109			EXAMINER GU, SHAWN X	
			ART UNIT 2189	PAPER NUMBER
			MAIL DATE 11/28/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/668,833

Applicant(s)

ROWAN ET AL.

Examiner

Shawn X. Gu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 October 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. This Office action is in response to the amendment filed on 29 October 2007. Claims 1-29 are pending. All objections and rejections not repeated below are withdrawn.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-10, 13-15 and 21-29 are rejected under U.S.C. 102(e) as being anticipated by Wu et al. [US 6,981,114 B1] (hereinafter "Wu").

Per claim 1, Wu teaches a storage management system for backing up digital content of a storage system comprising a plurality of units of storage (blocks, Col.4, Ln.57-60), wherein the storage management system comprises:

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at least one data store (Fig 2, Mirrored Volumes 240 and Backup Device 250);

wherein the storage management system automatically intercepts all write commands issued to the plurality of units of storage, each write command comprising an instruction to overwrite at least one unit of storage with new data (Col.6, Ln.14-25, "each modification"); and

wherein the storage management system copies, prior to execution of each write command and without pre-scheduling (recording pre-modification values in the Modification Log 260 is not pre-scheduled), old data present at the at least one unit of storage into the at least one data store, wherein a record of the old data is timestamped (Col.6, Ln.14-25 and Ln.45-56, pre-modification values of modified blocks are backed up, also see Col.8, Ln.19-31), thereby storing backup data that correspond to a time period uninterrupted by any pre-existing volume-level snapshot of the plurality of units of storage (modifications stored in the Modification Log between two snapshots, see col. 6, lines 14-36); and

wherein the storage management system is further configured to identify historic data that were present in a specified portion (col. 4, lines 57-67, modified block) of the plurality of units of storage during the time period based at least in part on the backup data (col. 5, lines 46-58, col. 6, lines 65-67, col. 7, lines 17-25, col. 9, lines 40-61 and col. 10, lines 31-55), the identification identifying less than a pre-existing volume-level snapshot of the storage system ("... restore all or part of the original volume to ... identify data blocks modified between T1 and

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T2 and the pre-modification values of those modified blocks", see col. 6, lines 65-67 and col. 10, lines 33-43).

Per claim 14, it is clear the method of the claim is already substantially disclosed in claim 1 and must be performed by claim 1's storage management system. For the instant claim, the data store is taught by Wu's Backup Device 250 in Fig 2. Wu also teaches the identification identifying less than the entire plurality of units of storage ("... restore all or part of the original volume to ... identify data blocks modified between T1 and T2 and the pre-modification values of those modified blocks", see col. 6, lines 65-67 and col. 10, lines 33-43).

Per claim 23, it is clear the claim is already substantially discloses as described above in claims 1 and 14, and its data store is taught by Wu's Backup Device 250 in Fig 2. Wu further teaches a computer readable medium having the code performing the limitations of this claim (Col.6, Ln.36-37; Col.11, Ln.28-39).

Per claim 2, Wu teaches the storage system further comprises one or more physical storage devices (Fig 2, Primary Volumes 220, Mirrored Volumes 240, and Backup Device 250) on which the digital content of the storage system is stored.

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Per claims 3 and 15, Wu teaches an address for accessing the storage system comprises a device identifier (Wu's backup system must be able to identify the physical devices in claim 2 in order to perform read/write operations) and a location identifier (the block to be written must be identified, Col.4, Ln.57-60).

Per claim 4, Wu teaches the device identifier identifies a physical storage device (Wu's system must be able to identify the physical device which contains the requested data).

Per claim 5, Wu teaches the device identifier identifies a logical device (logical volumes, Col.4, Ln.51-60).

Per claim 6, Wu teaches the digital content of the storage system can be access by specifying an address and a time, and the time specifies that the digital data retrieved from the address is the most recent digital data that was written to the address at or before the time (restoration to original volume at a point in time, Col.5, Ln.46-58 and Col.6, Ln.65-67).

Per claim 7, Wu teaches the time is explicitly specified in a request to access a unit of storage ("request to restore ... to its state at time T1", see Col.10, Ln.31-43 and Col.9, Ln.45-61).

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Per claim 8, Wu teaches the time is specified in a command to the storage system separate from a request to read a unit of storage (Wu's teaching is implemented in a file system with a database, see Col.6, Ln.36-37, Col.11, Ln.28-39, therefore the time specification and the actual file system/database level read request are separate).

Per claim 9, Wu teaches the storage management system creates a virtual device (snapshots are timestamped; see Col.5, Ln.50-58, Col.6, Ln.46-48), wherein the time is specified when the virtual device is created (Col.6, Ln.46-48), and is applied when the virtual device is accessed (col.10, Ln.31-43, snapshots and their timestamps are used for reconstruction and restoration, Col.9, Ln.45-61, snapshots and modification log records are identified by creation time).

Per claim 10, Wu teaches new data is written to the virtual device without overwriting data that was written to the storage system after the time specified when the virtual device was created (a snapshot only stores data that were present in the storage system before or at the time when it was created, and Wu's system can hold a number of snapshots before deleting old ones when new ones are created; see Col.7, Ln.6-7).

Per claim 13, Wu teaches the units of storage are blocks (Col.4, Ln.57-60).

Per claim 24, Wu teaches the storage device command is a write command (command/request for restoration, Col.10, Ln.31-43) and the point in time is a current time (the request time can be any time in the past or present, since Wu's system can construct snapshots for the original volumes at any past time; see Col.9, Ln.45-61).

Per claim 25, is it clear the claim is already substantially disclosed as described above (see claim 14).

Per claim 21, it is clear that the apparatus of the claim is already substantially disclosed as described above in claims 1, 6, 9, 14 and 23 by Wu, which further teaches a storage appliance (Fig 2, all except CPUs 204) that interfaces with a computer, and at least one current store (Fig 2, Mirrored Volumes 240) and at least one time store (Fig 2, Backup Device 250) comprised within the storage appliance.

Wu further teaches that the at least one current store maintaining a current mirror copy of digital content in the one or more physical storage devices (Col.5, Ln.5-45).

Per claim 22, it is clear the claim is already substantially disclosed by claims 21 and 23 as described above.

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Per claim 26, Wu further teaches the at least one data store comprises a first data store (Fig 2, Mirrored Volumes 240) and a second data store (Fig 2, Backup Device 250), and wherein the first data store maintains a current mirror copy of digital data stored in the plurality of units of storage (Col.5, Ln.5-45), and wherein the second data store contains the old data and the timestamped record of the old data (Col.6, Ln.14-37).

Per claim 27, Wu further teaches that after the old data is copied to the second data store, the at least one unit of storage is overwritten with the new data (pre-modification values are backed up before being overwritten, Col.6, Ln.14-37), and the current mirror copy in the first data store is updated with the new data (writes to the original volumes also update the mirrored volumes, Col.5, Ln.5-27).

Per claims 28 and 29, it is clear the claims are already substantially disclosed as described in claims 26 and 27, except in claims 28 and 29 the second data store is taught by Wu's Mirrored Volumes 240 in Fig 2.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject

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matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 11, 12 and 16-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wu, in further view of "UNIX in a Nutshell" [Daniel Gilly and the staff of O'Reilly & Associates, Inc] (hereinafter "Gilly").

Per claims 11 and 16-18, Wu already substantially discloses the claims as described above, but does not clearly state that a command to the storage system specifies that the time is implicitly a current time. However, the teaching of UNIX is presented by Wu (Col.3, Ln.45-47). It is clear that implicitly providing the current time as the default when accessing a system wherein time is a necessary argument simplifies the command syntax and increases the user-friendliness of the system since the current time is one of the most frequently used time in such commands. Gilly teaches a "cal" command in the UNIX operating system (Pg. 2-10), wherein a calendar for the current month is displayed to the user when the command is sent to the system with no arguments, thereby implicitly specifying the current time as the default argument. Therefore it would have been obvious to one ordinarily skilled in the art at the time of the applicant's invention to incorporate the feature in Gilly's "cal" command into Wu's command in order to simplify command syntax and increase user-friendliness of the Wu's system.

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Per claims 12 and 20, Wu already substantially discloses the claims as described above, but does not specifically state that the time is specified relative to the current time. However, Wu teaches the use of UNIX operating system (Col.3, Ln.45-47). It is clear that specifying a time relative to the current time when accessing data provides a useful condition for the user to restrict the access to a certain group of data without knowing the exact time value, thereby increasing the user-friendliness of the command and the system. Gilly teaches a "find" command in the UNIX operating system (Pg. 2-47 and 2-48), wherein a time relative to the current time is specified as an argument to access data. Therefore it would have been obvious to one ordinarily skilled in the art at the time of the applicant's invention to incorporate the feature in Gilly's "find" command into Wu's command in order to increase user-friendliness of the Wu's system.

Per claim 19, Wu teaches the method further comprises writing data to the virtual storage device (Pg. 5, Para. 0061; Fig 3, 340 Cache Granules).

Response to Arguments

6. Applicant's arguments with respect to claims 1-29 have been considered but are moot in view of the new ground(s) of rejection. The newly added limitations are taught by Wu [US 6,981,114 B1] as set forth above.

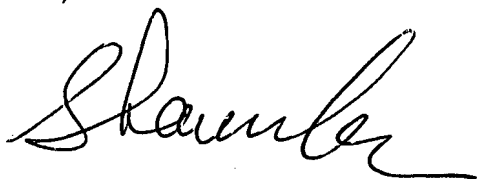
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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shawn Gu whose telephone number is (571) 272-0703. The examiner can normally be reached on 9am-5pm, Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Reginald Bragdon can be reached on (571) 272-4204. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Shawn X Gu
Patent Examiner
Art Unit 2189



DONALD SPARKS
SUPERVISORY PATENT EXAMINER

24 November 2007